1 SYSTEM FOR INEXPENSIVELY EXECUTING ONLINE PURCHASES

2 BACKGROUND OF THE INVENTION

3 This invention relates to payment of online purchases, and more particularly to a

4 system that executes such payments in a efficient and cost-effective manner so as to make

5 it economical to sell and purchase online products and services priced as low as just a few

6 pennies per item.

7 The major issues that confront online purchasing systems are fraud, security,

8 execution speed, and transaction costs. The last of these issues, transaction costs, is of

9 particular concern to Internet vendors because of the nature of products typically sold

10 over the Internet, and price expectations of their customers. Many of the products and

11 services provided over the Internet are information-based, with virtually zero incremental

12 cost of goods and small cost of delivery. As such, customers have expectations of low

13 prices for such goods and services. Such expectations, coupled with the cost and

14 inconvenience of executing online transactions have contributed to the commonly used

15 practice of companies giving away software and information for free.

16 Existing electronic payment methods are either costly, slow to consummate, or

17 both. For example, debit cards typically costs $0.50 per transaction. (Banks also impose

18 dollar limits on the amount that can be debited.) Electronic check payments are only

19 slightly better. Electronic bill payment systems typically charge users around $0.20 per

20 transaction, and can take several days to deliver payment to the Internet-based merchant.

21 "Electronic Cash" systems have been developed to support on-line transactions.

22 However such e-cash systems have yet to be adopted on a broad scale, and their cost-

23 effectiveness when used exclusively for low-value items has yet to be established.

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1   The "free information" model (paid for by advertising) actually works to the

2   disadvantage of Internet users. Since vendors cannot economically collect the small

3   revenue associated with each transaction, there is little financial incentive for small-

4   transaction businesses to emerge on the Internet, thereby limiting the richness of products

5   and resources available to users. Furthermore, many free Web sites that do exist tend to

6   be overloaded, resulting in long waits times, because the Web site owners cannot afford

7   to invest in infrastructure that would improve responsiveness.

8   A low-cost online purchasing system can stimulate more diversity and

9   competition in Internet-based services. Such products and services might include, for

10   example, drawings, maps, greeting cards, publications, recipes, search services, advice

11   services, sales alerts, stock alerts, whether and traffic alerts, and buying services. Thus a

12   purchasing system that could economically execute transactions of arbitrary size would

13   benefit both customers and vendors, and further stimulate e-commerce.

14   A new paradigm is also needed for the way financial institutions are reimbursed

15   for supporting the transactions of online vendors. Specifically, instead of charging online

16   vendors on a per-transaction basis, banks may charge online vendors for maintaining

17   accounts. Alternatively, banks may charge online vendors based on the dollar volume of

18   transactions processed by the bank on behalf of the vendor. Still another model is for

19   banks to serve as an Internet portal through which buyers are authenticated for making

20   purchases from online vendors, with banks charging online vendors for access through

21   the portal. This model is analogous to mall operators charging shops in the mall rental

22   space and security fees. It is also clear that some combination of the above models is also

23   a possibility. The present invention supports all of the business models described above.

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BRIEF SUMMARY OF THE INVENTION

A system for making online purchases by executing internal electronic funds transfers from the buyers' bank account to the vendor's bank account, enabled by an intermediate funds transfer from the buyer's account to a holding account maintained by the buyer's bank or a third party. The system is further enabled by the buyer's bank acting as a portal to the Internet that pre-authenticates buyers, enforces security, and speeds the execution of online transactions.

BRIEF DESCRIPTION OF THE DRAWINGS

The drawing is a schematic of an exemplary embodiment of a system according to the present invention for making online purchases by executing electronic funds transfers from buyer accounts to payee accounts, enabled by a system of holding accounts, maintained by the banks or a third party.

DETAILED DESCRIPTION OF THE INVENTION

The drawing is a schematic of an online purchasing system according to the present invention. Buyers 11, 12, and 13, banks 21, 22, and 23, and application server 4 are connected by a network 3. Within the scope of the present invention, a network 3, may be replaced by a system of networks interconnecting the various elements of this invention so as to provide greater security or some other benefit to the system. The schematic has been simplified to show just three buyers 11, 12, 13 and three banks 21, 22, 23, but the same system can be extended to support any number of buyers and banks.

Within each bank 21, 22, and 23, resides three types of accounts, buyer accounts 71, 72, and 73, payee accounts 61, 62, and 63, and holding accounts 51, 52, 53. Without loss of generality, only one buyer account and one payee account are shown within each

1   bank for clarity of discussion, although the same system can be implemented to support

2   any number of buyer accounts and payee accounts residing in each bank. In practice each

3   bank will host multiple buyer and payee accounts. For the present invention, the term

4   "operator" refers to an agent that controls movement of funds into and out of a particular

5   account. Buyer accounts 71, 72, and 73 are owned and operated by buyers 11, 12, and

6   13, respectively. Payee accounts 61, 62, and 63 are owned and operated by online

7   vendors. Holding accounts 51, 52, and 53 are owned and operated by either the banks 21,

8   22, and 23, respectively in which holding accounts 51, 52, and 53 reside, or a third party.

9   The operator of the holding accounts 51, 52, and 53 is also authorized to move funds out

10   of buyer accounts 71, 72, and 73 and into payee accounts 61, 62, and 63. For the present

11   invention, the term "service bureau" refers to the operator of the holding accounts,

12   whether that operator is a collection of banks or a third party.

13   For the purposes of the present invention, the term "Internet portal" refers to an

14   application that performs services for buyers that enable either greater access to Web

15   pages or greater functionality for those Web pages visited by buyers. Buyers 11, 12, and

16   13 initiate the purchasing process by logging onto the application server 4 that serves as

17   an Internet portal for buyers 11, 12, and 13. The application server 4 authenticates each

18   buyer 11, 12, and 13 using authentication systems and routines well known to individuals

19   skilled in the art. For example, the application server 4 may prompt buyers 11, 12, and

20   13 to enter a private Personal Identification Number or PIN, to validate their identities.

21   Further, the application server 4 assures that only one instance of each buyer 11, 12, and

22   13 is logged on at any particular time, and that sufficient funds are in each buyer account

23   71, 72, and 73 to cover purchases as they arise. At the time that they log on, the

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1   application server 4 provides buyers 11, 12, and 13 with unique session codes that buyers

2   11, 12, and 13 use to identify themselves to online vendors for making purchases. The

3   session codes automatically expire when buyers 11, 12, and 13 end their sessions, and

4   after a designated period of inactivity within a session. Once logged on to the application

5   server 4, buyers 11, 12, and 13 may navigate to any Web page on the Internet to the sites

6   of online vendors.

7   Buyers 11, 12, and 13 initiate purchases by selecting an item on an online

8   vendor's Web site, and sending a payment request to the application server 4 that

9   includes the price of the item, and information, such as a product code, that uniquely

10   identifies the item to be purchased. Since buyers 11, 12, and 13 are logged onto the

11   Internet through the application server 4, the application server knows the identity of

12   buyers 11, 12, and 13, including their email addresses, unique session codes, and buyer

13   accounts 71, 72, and 73. Further, the application server 4 knows the identify of the online

14   vendor and whether it maintains an account at one of the banks 21, 22, 23, served by the

15   system. Prospective buyers 11, 12, and 13 need only give online vendors their unique

16   session codes at the time that they wish to make a purchase.

17   The application server 4 executes online purchases via a four-step process. First,

18   the application server 4 checks to determine if the online vendor maintains a payee

19   account 61, 62, or 63 with any of the banks 21, 22, and 23 served by the system. If

20   negative, the purchase is denied. If positive, the second step is for the application server

21   4 to instruct the service bureau to debit the buyer's account 71, 72, or 73 and credit the

22   corresponding holding account 51, 52, or 53 that resides within the same bank 21, 22, or

23   23 for the amount of the purchase. The debit is only permitted if buyer 11, 12, or 13 has

1   sufficient funds in their corresponding buyer account 71, 72, or 73 at the time of the

2   purchase to cover the purchase. The third step is to transfer funds, in the amount of the

3   purchase, into the payee account 61, 62, or 63 of the online vendor from the particular

4   holding account 51, 52, or 53 that resides within the same bank 21, 22, or 23. In general,

5   a particular buyer 11, 12, or 13 will not maintain a buyer account 71, 72, or 73 at the

6   same bank where the online vendor involved in the transaction maintains his or her

7   account. Thus the holding account 51, 52 or 53 that is credited for a particular purchase

8   may not be the same holding account 51, 52, or 53 from which funds are drawn to pay the

9   online vendor involved in the transaction. Imbalances in holding accounts 51, 52, and 53

10 that arise because of these type transactions are settled at the end of the transaction day

11 by moving funds between the various holding accounts 51, 52, and 53.

12   The fourth step is for the application server 4 to notify both the online vendor and

13 buyer 11, 12, or 13 that the purchase has been completed and that funds have been

14 transferred into and out of appropriate accounts. A Web page is pushed to the buyer 11,

15 12, or 13 notifying them of the purchase. Separately, for security reasons, the buyer 11,

16 12, or 13, is sent an email message to their email address on record confirming the

17 purchase. The online vendor's purchase confirmation contains the product code, or other

18 information sufficient to identify the item being purchased, the session code of the buyer,

19 and the amount deposited into the online vendor's payee account 61, 62, or 63. The

20 online vendor uses the session code to release the product to the appropriate buyer 11, 12,

21 or 13. This completes the purchase and payment cycle.

22   Because of the account settlement processes employed by commercial banks,

23 there is no guarantee that fund transfers that were approved earlier in the day will have

1   sufficient funds to cover then at the time of settlement. Settlement usually takes place at

2   night after the close of transactions. During settlement, commercial banks employ a

3   priority system that determines the order in which funds are withdrawn from accounts. It

4   is thus possible for a high-priority withdrawal to occur that draws an account down to a

5   level insufficient to satisfy a lower-priority withdrawal registered earlier in the day. Thus

6   to avoid all transaction risks, online vendors would ordinarily have to wait until the next

7   day to be assured that payments are valid. However, online purchasers typically are only

8   willing to wait a few seconds for payment approvals, especially for low-priced items. A

9   combination of solutions may be employed to address the problem of granting payment

10   approval in near real-time, yet minimizing transaction risks for online vendors. One

11   approach is to require buyers 11, 12, 13 to transfer funds into their respective holding

12   accounts 51, 52, 53 the day prior to making any online purchases. Purchases then may be

13   approved up to the limit of their funds in holding accounts 51, 52, and 53. A

14   disadvantage of this approach is that buyers are denied 11, 12, 13, the use of funds

15   deposited in holding accounts 51, 52, 53 until purchases are made. A second approach is

16   to place a dollar limit on what buyers 11, 12, 13 can purchase in one day, and for the

17   service bureau, online vendors, and respective banks 21, 22, 23 to agree on who covers

18   the costs of transactions that fail at settlement. Some agreements may call for sharing

19   costs between the service bureau, online vendors, and banks 21, 22, and 23. Some

20   combinations of these approaches may also be used as well as others not explicitly

21   identified herein.

22   The service bureau may cover its operating costs with payments from banks 21,

23   22, 23, transaction charges from online vendors, or with payments from buyers 11, 12, 13

1 themselves. Similarly, banks 21, 22, 23 may cover their costs by charges to either buyers

2 11, 12, 13 or transaction charges to online vendors. Banks may also charge online

3 vendors special fees for hosting payee accounts 61, 62, and 63.

4   In general, at the end of any given transaction period there will be an imbalance in

5 the funds transferred into and out of each holding account 51, 52, and 53. These various

6 holding 51, 52, 53 must be settled. Since the sum of the imbalances in the various

7 holding accounts 51, 52, 53 will be zero, settlement may be accomplished through a

8 series of external electronic funds transfers (EFT). In general, the number of EFTs

9 required to achieve settlement is equal to one less than the number of holding accounts

10 51, 52, 53. That is, for an online purchasing system consisting of N distinct holding

11 accounts, then N-1 separate transfers would be sufficient to settle all accounts. A

12 preferred settlement routine consists of first transferring all the excess funds from those

13 holding accounts having excess deposits into the one holding account having the largest

14 deficit. The second and final step is to transfer all of the excess funds from the holding

15 account, that formerly had the largest deficit, into the remaining holding accounts that

16 have deficits, in amounts necessary to exactly balance each remaining holding account.

17 The dashed lines in Fig. 1 shows the virtual paths by which funds are transferred between

18 the various holding accounts 51, 52, 53.

19   At the end of the transaction day, the application server 4 collects, partitions and

20 formats payment date to be sent to the online vendors. The corresponding payment data

21 is relayed to buyers 11, 12, 13 and their banks 21, 22, 23. Also, at the end of the

22 transaction day, the application server 4 generates a log of transaction files for each

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1   online vendor, and delivers this information to the online vendors and their respective

2   banks 21, 22, 23.

3   Numerous modifications to and alternative embodiments of the present invention

4   will be apparent to those skilled in the art in view of the foregoing description.

5   Accordingly, this description is to be construed as illustrative only and is for the purpose

6   of teaching those skilled in the art the best mode of carrying out the invention. Details of

7   the structure may be varied substantially without departing from the spirit of the

8   invention and the exclusive use of all modifications which come within the scope of the

9   appended claims is reserved.

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